SUBJECT TEACHING GUIDE

681 - Biological Tools in Environmental Engineering

Master's Degree in Environmental Engineering and Management

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Master's Degree in Environmental Engineering and Management			Type and Year	Optional. Year 1
Faculty	School of civil Engineering				
Discipline	ENVIRONMENTAL QUALITY				
Course unit title and code	681 - Biological Tools in Environmental Engineering				
Number of ECTS credits allocated	3	Term		Semester based (2)	
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. CIENCIAS Y TECNICAS DEL AGUA Y DEL MEDIO AMBIENTE
Name of lecturer	XABIER EDUARDO MORENO-VENTAS BRAVO
E-mail	xabier.moreno@unican.es
Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 2. DOCTORANDOS ECOLOGIA (2016)
Other lecturers	MARIA LUISA PEREZ GARCIA

3.1 LEARNING OUTCOMES

- - Ability to carry out microbiological controls in wastewater treatment plants
- Ability to apply toxicity test protocols.
- Ability to apply bioremediation protocols for contaminated media.
- Ability to investigate the evolution of eutrophication processes.
- Ability to apply bioindicators in the quality of aquatic environments.
- Ability to assess the degree of stress in natural environments.

4. OBJECTIVES

Provide basic knowledge of the principles, methods, techniques and processes of the main instruments applied in environmental engineering.

6. COURSE ORGANIZATION

CONTENTS	
1	Microbiologic Tools
2	Biochemical Tools
3	Ecological tools applied to Environmental Regulations
4	Group work proposal
5	Laboratory
6	Evaluation

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Written presentation of a proposed work	Work	No	No	20,00
Laboratory Practices Report	Laboratory evaluation	No	Yes	80,00
TOTAL				100,00

Observations

It will be necessary to pass the practical and theoretical exam, together with the presentation of the joint work.

Observations for part-time students

For part-time students, although it is recommended that they attend the laboratory practicals and submit the corresponding report, if they are unable to attend, the report will be replaced by a written practical exam. The final evaluation will correspond to the mark obtained in the practical exam and in the written work requested with the same percentages as indicated.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

- Heink, U. & I. Kowarik, 2010. What are indicators? On the definition of indicators in ecology and environmental planning. Ecological Indicators 10(3): 447-459
- Jorgensen et al. (Eds) 2005. Ecological Indicators for Assessment of Ecosystem Health. CRC press.
- Madigan,M.T., Martinko,J.M.; Dunlap, P.V. y Clark, D.P. Brok. Biología de los microorganismos. Ed Pearson (2009)
- Rosal, P.; Oliver, J. Bioquímica: Técnicas y métodos. Ed Hélice.
- Klaassen CD, Watkins JB. Casarett y Doull. Fundamentos de Toxicología. Madrid, McGraw Hill Interamericana, 2005.
- Principios de Biorrecuperación. Mc Graw Hill . 1999.
- Biotecnologia del medio ambienta: Principios y aplicaciones- Mc Graw Hill . 2001.